

Difference Between Leucoplast Chloroplast and Chromoplast

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Key Difference – Leucoplast Chloroplast vs Chromoplast

Plastid is a small organelle found in the plant cell cytoplasm. According to past research, it is believed that plastids are descendants of cyanobacteria which are photosynthetic bacteria. They have entered into eukaryotic plants and algae by forming an endosymbiotic relationship. There are three main types of plastids: leucoplasts, chloroplasts, and chromoplasts. **Leucoplasts are colourless plastids that are specialized in storing foods in plants. Chloroplasts are green colour plastids that are specialized for photosynthesis. Chromoplasts are different coloured plastids which are responsible for distinct colours of petals and other plant parts.** This is the key difference between leucoplast chloroplast and chromoplast.

What is Leucoplast?

Leucoplast is a small organelle found in plant cells. It is a type of plastid which is specialised to store foods such as starch, protein and lipids in plants. Leucoplasts are colourless. Hence, they do not attract or attack pollinators. They also do not contain photosynthetic pigments. Moreover, other types of pigments are also not present in leucoplasts. Leucoplasts are smaller than chloroplasts and have a variable morphology. They are usually located in non-photosynthetic tissues such as roots, bulbs and seeds. They are mostly found in unexposed tissues of plants.

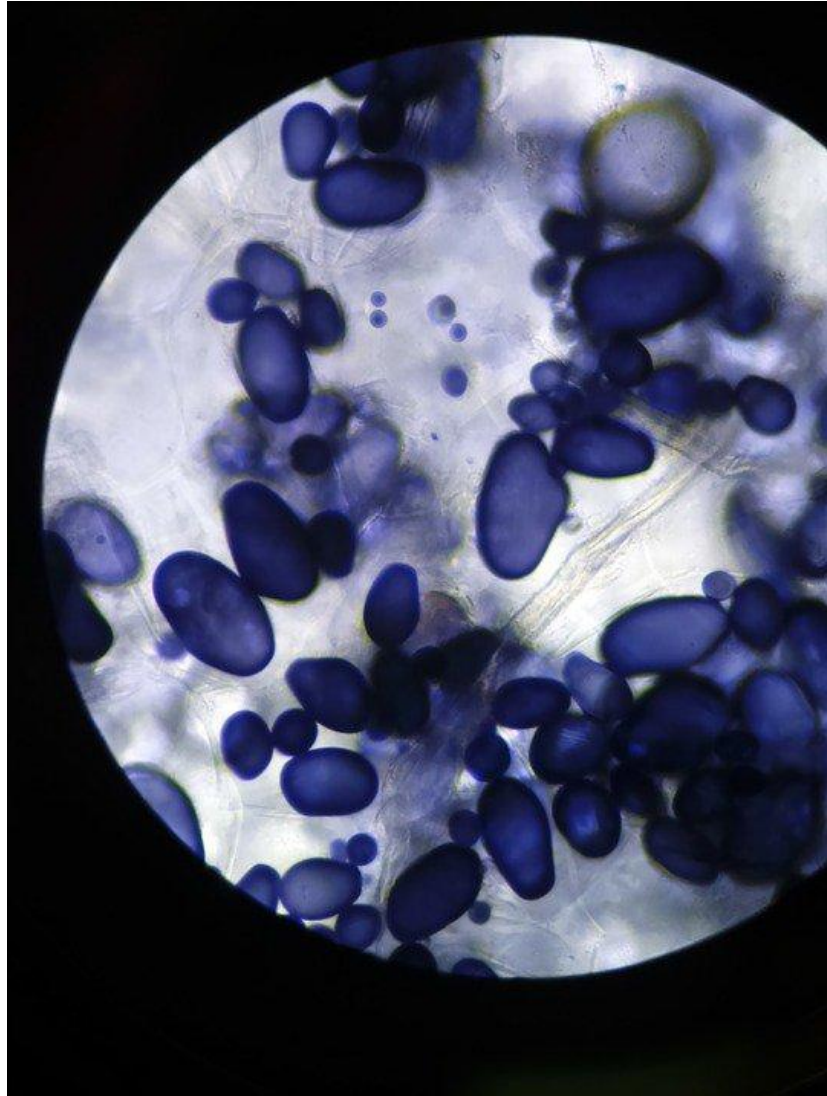


Figure 01: Leucoplasts – Amyloplasts

There are three types of leucoplasts named amyloplasts, elaioplasts, and proteinoplasts. Amyloplasts store starch. Elaioplasts are storages of fats and oils of seeds. Proteinoplasts store proteins in seeds. Leucoplasts can change into other plastids as well.

What is Chloroplast?

Chloroplast is a type of plastid which contains photosynthetic pigments called [chlorophylls](#). Chloroplasts are extremely important organelle in plants cell and they are the organelles of [photosynthesis](#). They are the most common type of plastids found in plants. Chloroplasts synthesise carbohydrates using the energy of

sunlight. Chloroplasts have different shapes such as spherical, ovoid, stellate, spiral and cup shape. They are evenly distributed in the plants' cytoplasm.

Chloroplast is covered with two membranes known as inner and outer membranes. The matrix of the chloroplast is known as [stroma](#) and it contains cylindrical structures called [grana](#). Each chloroplast may contain 10 to 100 grana in stroma. Grana contain disc shaped membranes called thylakoids which are the site of photosynthesis.

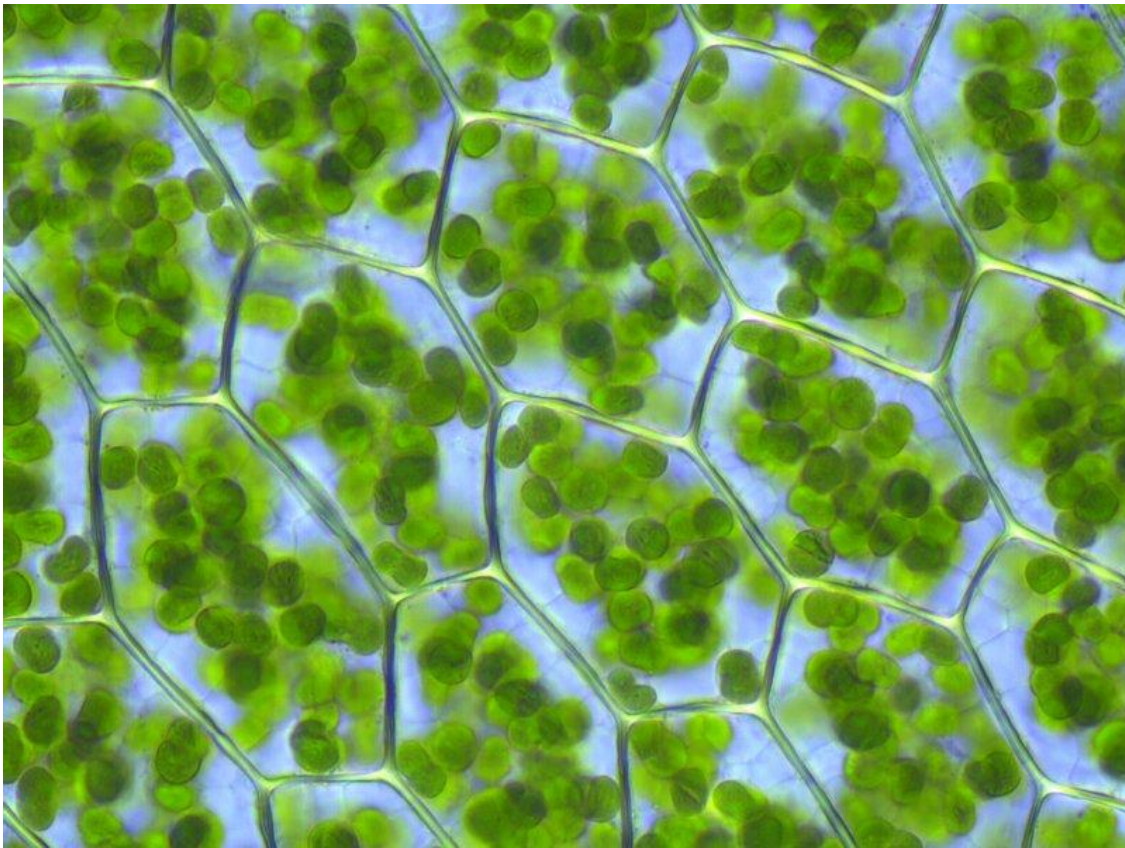


Figure 02: Chloroplasts

Chloroplasts contain ribosomes, [DNA](#), [RNA](#) and soluble enzymes necessary for photosynthesis. Chloroplasts are believed to enter into higher plants from a symbiotic relationship between photosynthetic bacteria.

What is Chromoplast?

Chromoplast is a pigmented type of plastid found in fruits, flowers, roots and ageing leaves. Chromoplasts produce distinct coloured pigments. Chloroplasts convert into chromoplasts in ripening fruits. [Carotenoids](#) and xanthophylls are two

common pigments synthesised by chromoplasts. Carotene is an orange colour pigment while xanthophylls are yellow in colour.

Chromoplasts are responsible for attracting pollinators. Various coloured flowers are possessed by plants to attract pollinators as a mechanism of **cross pollination**. Bright coloured fruits help dispersal of seeds. Though chloroplasts contain green colour pigments, they are not considered as chromoplasts. The term chromoplast is used to refer to plastids which contain pigments other than chlorophylls. However, chromoplasts can convert into chloroplasts.

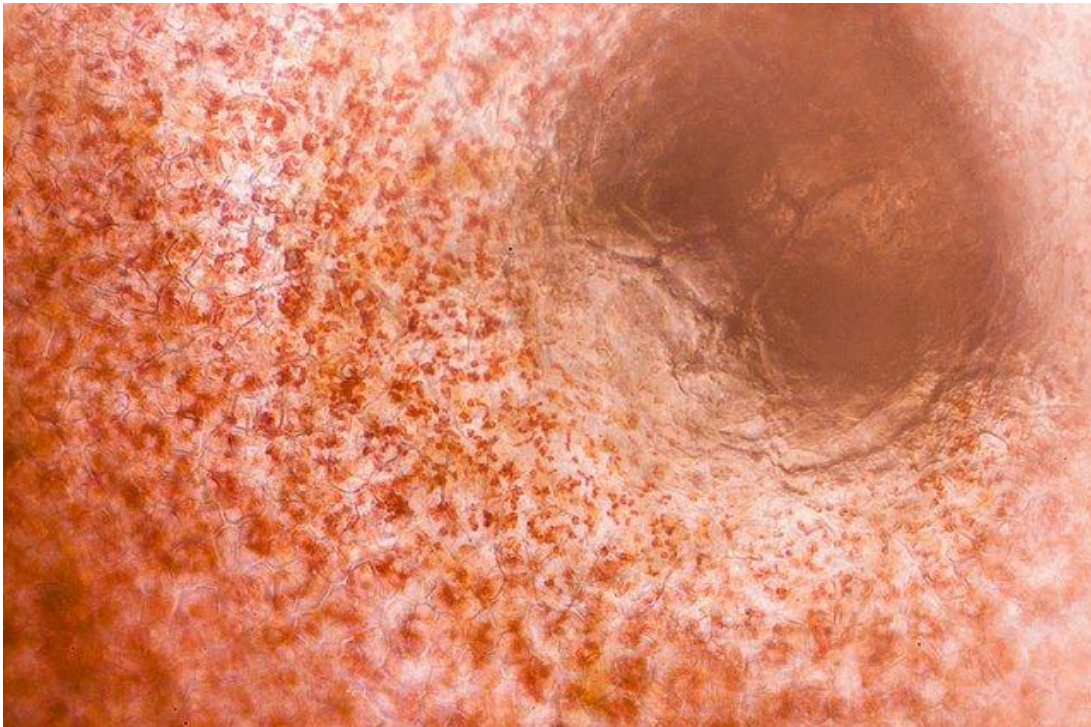


Figure 03: Chromoplasts in orange fruit

What are the similarities between Leucoplast Chloroplast and Chromoplast?

- Leucoplast, chloroplast and chromoplast are small organelles called plastids.
- All these plastids are found in plant cells.
- All these plastids are essential organelles in plants.

What is the difference between Leucoplast Chloroplast and Chromoplast?

Leucoplast Chloroplast vs Chromoplast	
Definition	
Leucoplast	Leucoplast is a type of plastid specialised to store foods in plants.
Chloroplast	Chloroplast is a type of plastid specialised for the process of photosynthesis.
Chromoplast	Chromoplast is a type of plastid which contains distinct coloured pigments.
Color	
Leucoplast	Leucoplast is colourless.
Chloroplast	Chloroplast is green coloured.
Chromoplast	Chromoplast is coloured.
Function	
Leucoplast	Leucoplasts store proteins, starch and fats.
Chloroplast	Chloroplast synthesises carbohydrate by photosynthesis.
Chromoplast	Chromoplast gives different colours to plant leaves, flowers and fruits and help in attracting pollinators.

Summary – Leucoplast Chloroplast vs Chromoplast

There are three main types of plastids in plants. They are leucoplasts, chloroplasts and chromoplasts, which perform different functions in plants. Leucoplasts are plastids which store foods of plants such as fats, oils, starch, proteins, etc. Chloroplasts are the photosynthetic organelles of plants. They contain chlorophylls (green colour pigments). Chromoplasts are different coloured pigment containing

plastids of plants. Chromoplasts provide different colours to flowers, fruits, leaves etc. This is the difference between leucoplast, chloroplast and chromoplast.

References:

- 1."Plastids: Types, Structure and Function (With Diagram)." Biology Discussion. N.p., 14 July 2016. Web. [Available here](#). 15 July 2017.
- 2."Chloroplast." Wikipedia. Wikimedia Foundation, 14 July 2017. Web. [Available here](#). 16 July 2017.
3. Plastids. Plant Cell Biology., n.d. Web. [Available here](#). 16 July 2017.

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- 1."1221391" (Public Domain) via Pixabay
- 2."Plagiomnium affine laminazellen" By Kristian Peters — Fabelfroh – Self-photographed ([CC BY-SA 3.0](#)) via [Commons Wikimedia](#)
- 3."Those little spots on mandarin oranges..." by Umberto Salvagnin ([CC BY 2.0](#)) via [Flickr](#)

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APA: Difference Between Leucoplast Chloroplast and Chromoplast. (2017, July 23). Retrieved (date), from <http://www.differencebetween.com/difference-between-leucoplast-chloroplast-and-vs-chromoplast/>

MLA: "Difference Between Leucoplast Chloroplast and Chromoplast." Difference Between.Com. 23 July 2017. Web.

Chicago: "Difference Between Leucoplast Chloroplast and Chromoplast." Difference Between.Com. <http://www.differencebetween.com/difference-between-leucoplast-chloroplast-and-vs-chromoplast/> (accessed [date]).



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